

Active Management vs. Passive Management in the Colombian Private Pension Open Mutual Fund Industry: A Performance Analysis Using Proxy ETFs as Market Benchmarks¹

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ABSTRACT

The purpose of the present study is to find evidence that if actively managed Colombian private pension open mutual funds can outperform a specific market benchmark such as a passively managed ETF. After doing a review of the existing literature on the subject, the data from thirty (30) Colombian private pension open mutual funds along with the data of thirty (30) Exchange Traded Funds was used to obtain a set of common portfolio performance measures. The results obtained indicated that only two of the thirty portfolios under study were able to beat their respective market benchmarks on a risk-adjusted basis. The results indicate that in average a Colombian investor can obtain superior returns by investing in a passively managed product such as ETFs than in actively managed ones, such as the Colombian private pension open mutual funds. These results are consistent with the results of previous researchers and the existing body of literature on the subject of market efficiency.

INTRODUCTION

One of the main reasons of why investors invest in a particular kind of risky asset is to seek a higher rate of return than the one they can obtain by investing in a safer asset with lower returns. Is not a secret that individual investors tend to diversify risk by holding a portfolio in the hope that the gains obtained by a particular stock or bond can offset the losses of others assets that conform the investor's portfolio. Given the fact that investing in financial assets involves a considerable amount of risk and that for the average individual investor the cost of owning and structuring a diversified portfolio is quite prohibitive. The common practice is that the individual investor seeks the help of specialized institutions that offer a range of managed portfolios (usually these managed portfolios are called mutual funds), where the investor can invest in tailored products that meet the investor's specific needs. Of course these institutions charge a fee to the investors in return for the services they offer in order to meet their respective client needs. Usually, these institutions engage in the process of active management which means that they use their clients money to buy and sell securities in a frequent basis in order to beat a specific benchmark, such as a market or specific sector index, in order to obtain a higher return than the return observed for the benchmark for a similar period of time. In Colombia there are different kinds of institutions that offer these services being the most important, if measured by the value of assets under management, the Colombian private pension funds. However, given the myriad of financial innovation in recent years it is now possible for the individual investors to invest directly in products that mimic or replicate the returns of the most popular market indices or particular sector indices at a relatively low cost and without the risks involved in active management, these products are commonly known by the industry as Exchange Traded Funds (ETFs). Therefore, the purpose of the present paper is to find evidence that if indeed the Colombian private pension funds obtain higher returns for their clients than the ones that can be obtained by investing passively in replicating benchmark products such as ETFs.

BACKGROUND

What Are ETFs?

An ETF is very similar to a mutual fund in the sense that both hold a portfolio of securities. The main difference between the two is that an ETF can be sold and bought as any common stock throughout the business day, whereas the net asset value (NAV) units of a mutual fund portfolio are calculated at the end of the day. This means that any transaction of a particular investor involving the selling and buying of NAV units of a mutual fund usually takes a business day in order to be effective, as opposed to an ETF transaction that can be done immediately at market prices (Gastineau, 2001). The first ETF was created in 1993 and was traded at American Stock Exchange. An ETF share is simply common stock that gives ownership over a pool of assets deposited in a trust. The process of creating an ETF is quite simple, it begins when a financial institution buys a portfolio of securities and deposits them with a third party trustee. As a separate legal entity, the trustee can then issue common stock based on the value of the securities under custody and these common stocks are given back to the financial institution that owns the portfolio in order to be marketed to third party investors as ETF shares (Poterba & Shoven, 2002). One of the distinct features of ETFs is that most of them have been designed to track a specific market or economic sector index. This feature is of paramount importance because it allows the individual investor to hold a stock that in itself is a diversified portfolio with the features of a common stock transaction. This means that the investor can buy the ETF on margin or short the ETF according to market perception. For example the Powershares QQQ (Ticker: QQQQ) ETF holds all the stocks that compose the NASDAQ-100 and the returns on its shares is highly correlated with the one of the index. However, most ETFs like equity mutual funds suffer from what is called a “tracking error” which means that the ETFs are not perfectly correlated with the indices they are supposed to replicate. However, for practical investment purposes the correlation tends to be quite high, and most of the differences can be explained by the operating expenses charged by the ETF administrator and the bid-ask spread on trading days (Poterba & Shoven, 2002). The growth of the ETF industry is quite overwhelming in 1995 there were only two ETFs available to investors managing 1 billion in assets, by the year 2006 this figure has grown to 335 billion assets distributed in more than 263 ETFs that cover a wide variety of market and sector indices as well as commodities benchmarks (NYSE, 2006). One of the factors that can explain the increasingly popularity of ETFs is the fact that the administrators of these kind of products act as passive managers which means that they only buy and sell securities of the trust when the composition of the assets of the index that the ETF is trying to replicate changes for some reason, as opposed to mutual funds where the administrators act as active managers selling and buying stock in order to try to beat their respective investments benchmarks. This is why many investors see the ETFs as an investment alternative that allows them to hold a diversified portfolio at a low cost with an easy benchmark to follow, as opposed to the traditional mutual fund administrators whose fund returns can be affected negatively by bad timing and selectivity decisions by the fund manager.

The Colombian Private Pension Fund Industry

In Colombia the private pension fund industry is quite recent when compared with industrialized countries. It was just until 1993 that private pension fund companies in Colombia began their operations. Their growth in clients and assets under management is quite astonishing, in 1995 there were 1,710,865 clients affiliated or roughly 34% of the active economic population at the time, by 2007 the number of clients has grown to a staggering 7,406,882 or 55% of the active economic population. In 1995 the assets of the funds totaled USD 262 million, by the end of 2007 the figure has grown to USD 25.732 billion⁵ (Asofondos, 2009). In Colombia, the private funds have a series of legal restrictions regarding the type of securities in which they can invest, therefore all of the funds practically invest in the same kind of portfolio which is primary composed by public debt, dollar denominated debt and highly rated Colombian equity (Asofondos, 2006), therefore the returns of each fund tends to be very similar to the others given that the basic composition of the portfolios in which the fund invest their clients money is basically the same. However, besides the basic pension product that is regulated by law, the funds are not restricted to offer their clientele a wide variety of mutual funds in which the before mentioned restrictions do not apply, and in which the investor is free to choose which investment vehicle suits his investment objectives best. This is done with the purpose of providing the investors an opportunity to explore different kind of investment opportunities in the hope of increasing the amount of their savings in the fund of for short-term gains in speculative opportunities. One reason over why Colombian investors prefer to invest in the mutual fund offered by the private pension fund companies rather than trough a brokerage firm relies in the fact that the amounts needed to invest are much smaller in the former. Another reason relies in the fact that for the economic active population, the investment can be done by direct discount on the persons payroll in a series of monthly installments which in turn helps the wage earner to reduce the amount of income tax he has to pay monthly based in the amount earned (this income tax is deduced directly from the person payroll by the employer who them transfers it directly to the government). It is important to mention that if an investor invest in a mutual fund trough its private pension company and keeps the investment for a period of five years he can gain the benefit of keeping the money that he saved from paying a lower monthly income tax, if instead the investor decides to sell its investment at an earlier time he losses the tax benefit and has to pay the amount he owes the government for the monthly savings he obtained by a reduced income tax. Usually the persons that invest in these kinds of products are the ones with the higher incomes and this alone can explain for the increasing demand of mutual funds administered by Colombian private pension fund companies. This demand is supported by their growth in clients and assets under management, in 1995 there were just 12,171 clients for this kind of products, by 2007 the number of clients has grown to 340,905. In 1995 the assets of the mutual funds under management by Colombian private pensions companies totaled barely USD 37 million by the end of 2007 the figure has grown to USD 3.308 billion⁶ (Asofondos, 2009). One distinctive feature is that most of the mutual funds managed by these

⁵ These figures are calculated using the official exchange rate for the dates 31/12/1995 and 31/12/2007, which were USD/COP=\$987,65 and USD/COP=\$2.014,76 respectively.

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companies are actively managed with a well defined investment objective. Therefore, the question to bear in mind is that if the mutual funds administered actively by these companies provide superior returns that passively managed products such as ETFs?

LITERATURE AND THEORETICAL REVIEW

The literature concerning the evaluation of mutual fund performance is mostly based in the assumptions stated by the efficient market hypothesis (EMH). In its basic form, the hypothesis states that for the individual investor it is very difficult to beat the market (or a market portfolio) because all the publicly available information given to a group of competing investors is already fully priced in the particular securities that compose each investor's portfolio, therefore since all the prices already reflects the market sentiment is impossible for an individual investor to obtain superior performance based on the same information that is also available to other competitors (Fama, 1970). Of course this hypothesis is not popular among investors and portfolio managers whose job depends in providing results that beat the average market performance (Varami & Kalash, 2008). The empirical evidence concerning the EMH has been widely documented and with diverse results. The first studies concerning mutual fund performance provided support to the EMH hypothesis. One of the first studies was conducted by William Sharpe using a measure of total risk-return performance for 34 funds for the period between 1945 and 1953 that concluded that in average the funds underperformed the Dow Jones industrial index for the same period (Sharpe, 1966). These results were confirmed by Michael Jensen who used the Capital Asset Pricing Model (CAPM) for finding the expected return for a set of mutual funds between the period of 1945 and 1964. By comparing the expected equilibrium return according to the CAPM and its deviation from the funds actual returns, the conclusion was that the vast majority of the funds observed had negative alphas⁷. This particular finding implied that by that specific measure, the funds underperformed the market index for the period under observation (Jensen, 1968). Also, by using a systematic risk-return approach Jack L. Treynor came to the same conclusions than the previous studies found (Treynor, 1966). However, throughout the years several researchers have found evidence that contradicts some of the postulates of the EMH hypothesis. For example, certain studies have found statistical evidence that small capitalization mutual funds in the US have beaten the market benchmark on a risk-adjusted basis for the period between 1994-2007 (Varami & Kalash, 2008). Another study found that there were certain anomalies that contradicted the postulates stated in the EMH, especially those related with the behavior of securities prices over a certain period of time. If indeed markets are efficient, the prices of securities should change randomly as new market information is incorporated in those prices. Since, this new information act as a surprise to market participants and the news are random in nature. Statistically, the historical prices of securities traded in an efficient market should follow a random walk. If this is true the prices should have a lognormal distribution with the returns being normally distributed which is not always truth. Indeed, an empirical study found that for the period comprehended between 1962-1985 certain indices and small capitalization stocks did not behave randomly, giving away some evidence that contradicts the EMH postulates (Lo & MacKinlay, 1988). Some studies have also shown that a limited number of

⁷ Alpha is obtained by subtracting the fund actual return by the expected return obtained using the CAPM.

fund managers can beat the market based on superior selectivity and market timing skills (Lee & Rahman, 1990). This has opened an interesting body of literature concerning the role of active managers that can outperform the market based on two distinct abilities which are “timing” and “selectivity”. The ability of “timing” is related with the skill of knowing when is the right moment to sell or to buy a specific security. On the other hand, the “selectivity” skill can be explained by the manager’s ability on how to predict a specific stock future return (Admati, Bhattacharya, Pfleiderer, & Ross, 1986). Therefore, if in theory a manager has superior information than improve his “selectivity” and “timing” skills, this manager can outperform his competitors and would probably beat the market in a consistent basis. However, there is evidence that proves that if the investor cannot identify which managers really can outperform the market it would be in the best interest of this investor to stay in passive managed index funds (Bogle, 1998). The main reasons of why many fund managers are unable to outperform the market are explained by the fact that most of the mutual fund’s manager compensation schemes are tied to benchmark performance return measures. These compensation schemes are biased, in the sense that the performance measures used are (Admati & Pfleiderer, 1997):

1. Not consistent with the amount of risk that the investor engages in a particular investment.
2. Managers do not obtain the optimal portfolio for the investor.
3. There are not enough incentives to the manager to obtain more information than the one required to meet a specific benchmark.
4. The benchmark are not elaborated enough in order to remove underperformers from their management positions.
5. Does not have enough control systems to coordinate the risk tolerance of the investor with the risk tolerance of the portfolio’s manager.

In most of the research conducted until now there is strong evidence that the majority of active mutual fund managers generally do not have neither, superior timing or selectivity skills. On the other hand, the evidence regarding index mutual funds (passively managed) tends to show that by using risk-adjusted and transaction cost measures, these index funds tend to perform better than actively managed funds on average (Frino & Gallagher, 2001). Most of the research done on this subject has been focused mainly in index funds which have the same characteristics as open mutual funds. Therefore the literature on the benefits of ETFs is very scarce. Regarding ETFs, the research conducted until now has concluded that these products are not attractive to small investors due to higher transaction costs than the ones those investors will incur with index mutual funds (Dellva, 2001). Another study have pointed out that ETFs allows investors to make more rational choices and can protect them from certain market makers of providing them with bad prices or unfavorable market conditions, which in a certain way offset the higher transaction costs that are associated with buying and selling ETFs shares (Kostovetsky, 2003). On the international side little has been done regarding ETFs, but regarding the performance of US based international equity mutual funds, one study concluded that these funds did not provided either individually or in average a performance that surpassed the return obtained by a benchmark equity index for the period observed between 1982-1988 (Cumby & Glen, 1990). Given the fact, that in recent years the brokerage industry has gone through massive changes and that the transactions costs of buying and selling securities are relatively low, now even small investors for emerging markets such as

Colombia can trade now in the global market. It is in this context, that the present study would seek proof if indeed the actively managed Colombian private pension mutual funds can outperform passive managed investments benchmarks. For the purpose of this paper, the passive managed investment benchmarks would be chosen from the ETFs available in the market. The ETFs would be selected on the basis that their respective investment objectives are similar to those of the Colombian private pension mutual funds under study.

COMMON PERFORMANCE MEASURES

Sharpe ratio⁸

This is one of the most widely used techniques for calculating the risk-adjusted return of a portfolio or mutual fund. The reasoning behind the measure is that it allows the investor to perceive how many units of return there are per units of risk. One of the criticisms surrounding this measure is that the standard deviation is a very naïve approach in measuring risk (Bogle J. , 1999). The measure will also overestimate results in securities that not behave like the normal distribution. Besides these problems, the Sharpe ratio is still one of the most popular techniques for comparing risk-adjusted returns. The formula used to calculate the Sharpe ratio is:

$$\text{Sharpe Ratio} = \left(\frac{(R_p - R_f)}{\sigma_p} \right)$$

Where R_p = The average return of the portfolio for a specific holding period, R_f =The proxy for the risk free rate for a specific holding period and σ_p =The standard deviation of the portfolio for a specific holding period. Generally having investments with a higher Sharpe ratio than their benchmarks is good. The logic being that with a higher Sharpe ratio, the investor is obtaining more units of returns per units of risk assumed.

Jensen's alpha⁹

The Jensen's alpha evaluates the performance of an investment in terms of excess return over the theoretical return of the portfolio using the CAPM. Since the CAPM return is risk-adjusted, this means that for a higher risk we should expect a higher return. The measure is obtained by subtracting the actual return of a portfolio from the expected return of that portfolio obtained using the CAPM. The result obtained is commonly known as the Jensen alpha. Therefore, a positive alpha means that the portfolio over performed relative to its theoretical expected return. On the contrary, a negative alpha means that the portfolio underperformed relative to its theoretical expected return. The formula used to calculate the Jensen's Alpha is:

$$\text{Jensen's Alpha } (\alpha) = R_p - (R_f + (\beta_p \times (R_m - R_f)))$$

Where R_p = The average return of the portfolio for a specific holding period, R_f =The proxy for the average risk free rate for a specific holding period and β_p =The coefficient of regression of

⁸ (Sharpe, 1966)

⁹ (Jensen, 1968)

the portfolio as a dependent variable versus the market proxy as an independent variable for a specific holding period and R_m =The average for the proxy of market return for a specific holding period. One of the main problems of this measure is that the betas obtained tend to be unstable for different periods of time. This instability in beta can lead us to overstate the amount of systematic risk (very high betas) in periods of market turbulence. In the same way, unstable betas can lead us to understate the benefits of contrarian strategies (shorting the stock) in times of market turbulence (Jones & Yeoman, 2001).

Treynor ratio¹⁰

The Treynor ratio is calculated practically in the same way as the Sharpe Ratio, the main difference being, that it uses the systematic risk of a particular portfolio as measured by Beta as opposed to the portfolio variance which is used in the Sharpe Ratio. It is primarily used to compare the performance of a particular sub-portfolio to the one of a larger portfolio of similar characteristics that is more diversified (in the sense that the larger portfolio holds more securities than the sub-portfolio that is under observation). The interpretation is the same as the Sharpe ratio but in units of systematic risk. The problems with this performance measure are very similar with the ones encountered using the Sharpe Ratio or the Jensen's alpha. The formula used to calculate the Treynor ratio is:

$$\text{Treynor Ratio} = \left(\frac{(R_p - R_f)}{\beta_p} \right)$$

Where R_p = The average return of the portfolio for a specific holding period, R_f =The proxy for the risk free rate for a specific holding period and β_p = The coefficient of regression of the portfolio as a dependent variable versus the market proxy as an independent variable for a specific holding period.

Modigliani and Modigliani (M-Squared) measure¹¹

The M-Squared measure is different from the other measures in the sense that it calculates the performance of a specific investment in terms of real returns rather than in units. Therefore the interpretation is straightforward in the sense that the investment with the highest M-Squared is the one with the best performance. This distinct attribute of the M-Squared measure makes it easier for the investor to make comparison between different investments. The formula used to calculate the M-Squared measure is:

$$\text{M - Squared} = \left(\frac{(R_p - R_f)}{\sigma_p} \right) \sigma_m + R_f$$

Where R_p = The average return of the portfolio for a specific holding period, R_f =The proxy for the risk free rate for a specific holding period and σ_p =The standard deviation of the portfolio

¹⁰ (Treynor, 1966)

¹¹ (Modigliani & Modigliani, 1997)

for a specific holding period and σ_m =The standard deviation of the market proxy for a specific holding period.

DATASET

The data for the study comes from three private Colombian pension funds companies. The data was gathered from 30 different open mutual funds with different investment objectives for an observed time period. By analyzing the portfolio composition of the Colombian mutual funds, a group of ETFs were selected to serve as benchmarks to those open mutual funds. The benchmark ETFs were selected on the basis that their respective investments objectives were similar to those of the assets of the open mutual funds under study. These similarities between compositions and investment objectives can be observed in the following tables for the period under study:

TABLE 1-OPEN MUTUAL FUNDS ING COLOMBIA¹²

Mutual fund	Composition	Benchmark ETF	Investment objective	Observed period
High liquidity	Primarily investments in the Colombian money market over shorts periods of time.	SPDR S&P Emerging Latin America Tciker: (GML)	Replicate the performance of the S&P/Citigroup BMI Latin American Index	23/03/2007-30/06/2008
Basic Colombian Pesos	Medium term investments in fixed income instruments with low volatility.	iShares S&P Latin America 40 Index Ticker: (ILF)	Replicate the returns of the S&P 40 Latin America Index	01/04/2008-30/06/2008
Fixed Income	Long term investment in Colombian fixed income instruments	iShares S&P Latin America 40 Index Ticker: (ILF)	Replicate the returns of the S&P 40 Latin America Index	18/07/2006-30/06/2008
Conservative ING	Long term investment horizon – Primarily Composed by international funds and Colombian Fixed income.	iShares Barclays 20+ Year Treasury Bond Ticker: (TLT)	Replicate the performance of the Barclays Capital 20+ Year U.S. Treasury index	01/04/2008-30/06/2008
Moderate ING	The same objective as before, but with a small portion of international	iShares Dow Jones U.S. Index Ticker: (IYY)	Replicate the performance of the Dow Jones Index	01/04/2008-30/06/2008

¹² (ING, 2008) (Yahoo, 2008)

	stocks.			
Aggressive ING	The same as before, but with a greater portion of international stocks.	iShares Dow Jones U.S. Index Ticker: (IYY)	Replicate the performance of the Dow Jones Index	01/04/2008-30/06/2008
Basic Dollars	Long term investment-Fixed income in dollars and US dollars	iShares Barclays 20+ Year Treasury Bond Ticker: (TLT)	Replicate the performance of the Barclays Capital 20+ Year U.S. Treasury index	01/04/2008-30/06/2008

TABLE 2-OPEN MUTUAL FUNDS PROTECCION S.A.¹³

Mutual fund	Composition	Benchmark ETF	Investment objective	Observed period
Fixed Income Short term	Primarily investments in Colombian public debt over shorts periods of time, commercial Colombian paper and US, as Triple A Bonds from the financial sector	iShares S&P Latin America 40 Index Ticker: (ILF)	Replicate the returns of the S&P 40 Latin America Index	21/08/2006-30/06/2008
Fixed Income Long term	Same as the previous portfolio, but with a higher concentration of long term Colombian public debt.	iShares S&P Latin America 40 Index Ticker: (ILF)	Replicate the returns of the S&P 40 Latin America Index	01/04/2008-30/06/2008
High liquidity fixed income pesos	Primarily investments in commercial Colombian paper and CDs, as well as Triple A Bonds from the financial sector	iShares MSCI Emerging Markets Index Tickers: (EEM)	Replicate de the returns of the MSCI index.	01/04/2008-30/06/2008
Protección diversified	Composed primarily by	iShares S&P Latin America 40	Replicate the returns of the	01/04/2008-30/06/2008

¹³ (Protección S.A., 2008) (Yahoo, 2008)

	Colombian public debt and CDs.	Index Ticker: (ILF)	S&P 40 Latin America Index	
Colombian stock	Primarily composed of Colombian common stock and Colombian asset backed securities.	iShares S&P Latin America 40 Index Ticker: (ILF)	Replicate the returns of the S&P 40 Latin America Index	01/04/2008-30/06/2008
US stock	Composed of US mutual funds and an index ETF of the S&P 500.	iShares Dow Jones U.S. Index Ticker: (IYY)	Replicate the performance of the Dow Jones Index	01/04/2008-30/06/2008
Stock and fixed income in dollars	A small composition of Colombian money market investments and a greater composition in a global equity mutual fund.	iShares Dow Jones U.S. Index Ticker: (IYY)	Replicate the performance of the Dow Jones Index	01/04/2008-30/06/2008
Euro stock	A small composition of Colombian money market investments and a greater composition in a European equity mutual fund.	ISHARE SP EUR 350 IN Ticker: (IEV)	Replicate the performance of the S&P Europe 350 Index	01/04/2008-30/06/2008
Emerging markets stock	Most of the money is invested in the JP Morgan equity fund with a small proportion of the MSCI ETF.	Vanguard Emerging Markets Stock ETF Ticker: (VWO)	Replicate de the returns of the MSCI index.	01/04/2008-30/06/2008
Fixed Income Dollar long term	Primarily investments in fixed income US mutual funds	iShares Barclays 20+ Year Treasury Bond Ticker: (TLT)	Replicate the performance of the Barclays Capital 20+ Year U.S. Treasury index	01/04/2008-30/06/2008
US Technology Companies Stock	Primarily investments in technology oriented US mutual funds	Technology Select Sector SPDR Ticker: (XLK)	Replicate the performance of publicly traded companies in the technology	01/04/2008-30/06/2008

			sector	
Fixed Income Euros short term	Short term Euro public debt and Colombian public debt	WisdomTree Europe High-Yielding Equity Ticker: (DEW)	Replicate the performance of the WisdomTree Europe High-Yielding Equity index.	16/04/2008-30/06/2008
Fixed Income Dollars short term	Primarily investments in short term fixed income US mutual funds	iShares Barclays 1-3 Year Treasury Bond Ticker: (SHY)	Replicate the returns of the short-term sector of the United States Treasury market as defined by the Barclays Capital 1-3 Year U.S. Treasury index.	01/04/2008-30/06/2008
Japanese Stocks	Primarily investments in Japanese mutual funds in YENS	iShares MSCI Japan Index Ticker: (EWJ)	Replicate the performance of the MCSI index	01/04/2008-30/06/2008

TABLE 3-OPEN MUTUAL FUNDS BBVA¹⁴

Mutual fund	Composition	Benchmark ETF	Investment objective	Observed period
Stock	Primarily composed of Colombian common stock	iShares S&P Latin America 40 Index Ticker: (ILF)	Replicate the returns of the S&P 40 Latin America Index	12/09/2007-30/06/2008
Balanced	A small composition of Colombian CDs investments and a greater composition in a global equity mutual fund.	iShares S&P Latin America 40 Index Ticker: (ILF)	Replicate the returns of the S&P 40 Latin America Index	11/09/2007-30/06/2008
Money	Colombian CDs less than 180 days.	iShares S&P Latin America 40 Index Ticker: (ILF)	Replicate the returns of the S&P 40 Latin America Index	01/04/2008-30/06/2008
Enterprises	Colombian CDs, public debt and private issued Colombian funds.	iShares S&P Latin America 40 Index Ticker: (ILF)	Replicate the returns of the S&P 40 Latin America Index	12/09/2007-30/06/2008
Global	Mostly	iShares Dow	Replicate the	11/09/2007-

¹⁴ (BBVA Colombia, 2008) (Yahoo, 2008)

	composed of international equity funds.	Jones U.S. Index Ticker: (IYY)	performance of the Dow Jones Index	30/06/2008
Horizonte	Primarily composed of Colombian long term public debt US money market.	iShares S&P Latin America 40 Index Ticker: (ILF)	Replicate the returns of the S&P 40 Latin America Index	01/04/2008-30/06/2008
Liquidity	Saving accounts and Colombian public debt.	iShares S&P Latin America 40 Index Ticker: (ILF)	Replicate the returns of the S&P 40 Latin America Index	01/04/2008-30/06/2008
Plus	Mostly composed by Colombian public debt and a small portion of international mutual funds.	iShares S&P Latin America 40 Index Ticker: (ILF)	Replicate the returns of the S&P 40 Latin America Index	01/04/2008-30/06/2008
Premium	Mostly composed of other countries debt in US dollars.	iShares Dow Jones U.S. Index Ticker: (IYY)	Replicate the performance of the Dow Jones Index	01/04/2008-30/06/2008

The differences between the dates are mainly due to the fact that either the benchmark ETF or the Colombian mutual fund began their operations on that specific date. It is important to remember that ETFs are a rapidly expanding industry that just until recent years is catching up to the myriad of products offered by the US mutual fund industry.

METHODOLOGICAL ISSUES

In order to measure the actual performance for each fund under study relative to their benchmark ETF, the following adjustments were made to the data under study:

1. Since the study is done from the Colombian investor point of view all the data was converted to Colombian pesos in order to take into account the variability of the USD/COP exchange rate¹⁵.
2. For each ETF the closing price of a specific date was multiplied by the USD/COP exchange rate for that date.
3. The NAV for each fund is calculated at the end of the business day and is reported in Colombian pesos.
4. The daily average proxy for the risk free rate was calculated using the weekly average for the one-year CD in the Colombian money market¹⁶ for the different periods time under study.

¹⁵ (Banco de la Republica Colombia, 2008)

¹⁶ (Banco de la Republica: Colombia, 2008)

5. The Betas and the other descriptive statistics of the study were obtained by using the discrete daily returns for each of the time series under observation.
6. The periods of observation are not long enough to obtain the Colombian tax benefit, so the returns can be comparable without this leverage effect.

The results of the study are obtained by calculating the common performance measures for both the Colombian private pension fund and comparing them with their respective benchmarks.

RESULTS

Mutual funds managed by ING

The results obtained for the funds managed by ING Colombia in relation with their respective ETFs benchmark were the following:

High Liquidity

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
0,000673465	0,149865736	- 0,22477508	- 0,067032	-0,00455%	-0,42513%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	0,029642	0,000591	0,00000%	0,08233%

Risk-free average	0,02321%
Mutual Fund Return	0,01870%
Benchmark ETF Return	0,08233%

Fixed Income

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
0,000630086	0,274780457	- 0,13137653	- 0,059617	-0,00380%	-0,22283%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	0,035870	0,000667	0,00000%	0,08800%

Risk-free average	0,02133%
Mutual Fund Return	0,01758%
Benchmark ETF Return	0,08800%

Basic Colombian pesos

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
0,02377428	7,22785E-16	- 0,01429965	- 0,000986	-0,00385%	-0,00658%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	0,033239	0,000633	0,00000%	0,08401%

Risk-free average	0,02067%
Mutual Fund Return	0,01833%
Benchmark ETF Return	0,08401%

Conservative ING

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
0,084778832	5,65964E-05	- 0,07235000	- 0,004144	-0,03335%	-0,03737%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	- 0,026285	- 0,000211	0,00000%	-0,00042%

Risk-free average	0,02067%
Mutual Fund Return	-0,01446%
Benchmark ETF Return	-0,00042%

Moderate ING

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
-0,107202313	1,67828E-09	- 0,06432513	0,003199	-0,03808%	-0,04597%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	- 0,034057	- 0,000353	0,00000%	-0,01462%

Risk-free average	0,02067%
Mutual Fund Return	-0,01363%
Benchmark ETF Return	-0,01462%

Aggressive ING

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
-0,153093741	4,32679E-14	- 0,04678364	0,001869	-0,03401%	-0,02780%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	- 0,034057	- 0,000353	0,00000%	-0,01462%

Risk-free average	0,02067%
Mutual Fund Return	-0,00794%
Benchmark ETF Return	-0,01462%

Basic Dollars

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
0,107292071	3,28575E-07	- 0,08564735	- 0,003880	-0,03937%	-0,04804%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	- 0,026285	- 0,000211	0,00000%	-0,00042%

Risk-free average	0,02067%
Mutual Fund Return	-0,02096%
Benchmark ETF Return	-0,00042%

In the case of ING, it can be observed that four of the mutual funds as well as their respective benchmarks exhibited negative returns for the period under study. Two of the portfolios failed to reject the null hypothesis that their respective beta has some relation with the benchmark. However, there is evidence that in all of the actively managed portfolios by ING, none of these funds were able to beat their respective benchmarks on a risk-adjusted basis for the period under study. It is interesting that in four cases both the portfolios and their benchmarks

exhibited negative returns well below the risk-free average rate for the period under observation.

Mutual funds managed by Protección S.A.

Fixed Income Short term

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
0,009304297	0,001231765	-0,038340	- 0,006021	-0,00600%	-0,05117%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	0,022558	0,000429	0,00000%	0,06458%

Risk-free average	0,02170%
Mutual Fund Return	0,01610%
Benchmark ETF Return	0,06458%

Fixed Income Long term

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
0,009463228	1,32343E-05	-0,118742	- 0,015382	-0,01496%	-0,20778%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	0,022266	0,000429	0,00000%	0,06371%

Risk-free average	0,02084%
Mutual Fund Return	0,00628%
Benchmark ETF Return	0,06371%

High liquidity fixed income pesos

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
-0,000467232	0,459094251	- 0,25132616	0,176224	-0,00823%	-0,42672%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	- 0,000193	- 0,000003	0,00000%	0,02049%

Risk-free average	0,02084%
Mutual Fund Return	0,01260%
Benchmark ETF Return	0,02049%

Protección diversified

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
0,023288347	1,95629E-09	-0,064813	- 0,006125	-0,01526%	-0,10395%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	0,022266	0,000429	0,00000%	0,06371%

Risk-free average	0,02084%
Mutual Fund Return	0,00657%
Benchmark ETF Return	0,06371%

Colombian stock

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
0,211817519	1,3901E-18	-0,023784	- 0,001552	-0,04195%	-0,02496%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	0,022266	0,000429	0,00000%	0,06371%

Risk-free average	0,02084%
Mutual Fund Return	-0,01203%
Benchmark ETF Return	0,06371%

US stock

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
0,202960621	4,24418E-21	-0,079087	- 0,002708	-0,04611%	-0,06450%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	- 0,040398	- 0,000436	0,00000%	-0,02275%

Risk-free average	0,02084%
Mutual Fund Return	-0,03412%
Benchmark ETF Return	-0,02275%

Stock and fixed income in dollars

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
-0,12510368	2,75217E-08	-0,060993	0,003484	-0,04903%	-0,04498%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	- 0,040398	- 0,000436	0,00000%	-0,02275%

Risk-free average	0,02084%
Mutual Fund Return	-0,02274%
Benchmark ETF Return	-0,02275%

Euro stock

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
-0,149133595	7,29419E-06	-0,025664	0,002050	-0,03483%	-0,01053%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	- 0,023326	- 0,000285	0,00000%	-0,00767%

Risk-free average	0,02084%
Mutual Fund Return	-0,00974%
Benchmark ETF Return	-0,00767%

Emerging markets stock

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
0,043109412	0,029998596	-0,012920	- 0,003001	-0,01304%	-0,00148%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	0,001443	0,000025	0,00000%	0,02333%

Risk-free average	0,02084%
Mutual Fund Return	0,00790%
Benchmark ETF Return	0,02333%

Fixed Income Dollar long term

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
0,134048077	3,61734E-07	-0,057481	- 0,002766	-0,03311%	-0,02708%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	- 0,035444	- 0,000295	0,00000%	-0,00871%

Risk-free average	0,02084%
Mutual Fund Return	-0,01624%
Benchmark ETF Return	-0,00871%

US Technology Companies Stock

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
-0,129423306	2,08771E-07	-0,061868	0,004022	-0,05731%	-0,05024%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	- 0,035357	- 0,000406	0,00000%	-0,01978%

Risk-free average	0,02084%
Mutual Fund Return	-0,03122%
Benchmark ETF Return	-0,01978%

Fixed Income Euros short term

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
-0,02400123	0,182576108	-0,063664	0,016257	-0,04011%	-0,05656%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	- 0,037191	- 0,000455	0,00000%	-0,02418%

Risk-free average	0,02131%
Mutual Fund Return	-0,01771%
Benchmark ETF Return	-0,02418%

Fixed Income Dollars short term

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
0,168236946	2,63807E-08	-0,068491	- 0,002382	-0,03440%	-0,02422%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	- 0,051203	- 0,000337	0,00000%	-0,01285%

Risk-free average	0,02084%
Mutual Fund Return	-0,01923%
Benchmark ETF Return	-0,01285%

Japanese Stocks

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
-0,026327526	0,516626619	-0,051834	0,027913	-0,07512%	-0,04127%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	- 0,051883	- 0,000622	0,00000%	-0,04133%

Risk-free average	0,02084%
Mutual Fund Return	-0,05265%
Benchmark ETF Return	-0,04133%

In the case of Protección S.A., it can be observed that nine of the mutual funds as well as eight of their respective benchmarks exhibited negative returns for the period under study. Three of the portfolios failed to reject the null hypothesis that their respective beta has some relation with the benchmark. These three portfolios also have negatives betas. Another three portfolios also exhibit negative betas, but with low p-values which can lead us that this particular group can be somehow inversely correlated with their respective benchmarks. In the case of negative betas the Treynor ratio is meaningless since it attributes negative performances with superior returns (Georges, 2005). However, there is evidence that in all of the active managed portfolios by Protección S.A., none of these funds were able to beat their respective benchmarks on a risk-adjusted basis for the period under study. The only exception being the mutual fund of Japanese stocks which exhibited a slightly better performance, than its benchmark using the M-Squared measure. It is interesting that in eight cases the mutual funds and seven of their benchmarks exhibited negative returns. None of Protecciones' mutual funds under the period of study was able to outperform the average risk-free rate for the same period.

Mutual funds managed by BBVA

Stock

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
0,048698213	0,002037712	- 0,04593956	- 0,005861	-0,02843%	-0,07576%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	- 0,001057	- 0,000023	0,00000%	0,02219%

Risk-free average	0,02449%
Mutual Fund Return	-0,00405%
Benchmark ETF Return	0,02219%

Balanced

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
0,036076643	0,025120627	0,02433033	0,004261	0,01545%	0,07750%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	- 0,001041	- 0,000023	0,00000%	0,02222%

Risk-free average	0,02449%
Mutual Fund Return	0,03986%
Benchmark ETF Return	0,02222%

Money

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
-0,00078433	0,064312509	- 0,18475676	0,031589	-0,00252%	-0,34870%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	- 0,024885	- 0,000503	0,00000%	-0,02578%

Risk-free average	0,02449%
Mutual Fund Return	0,02201%
Benchmark ETF Return	-0,02578%

Enterprises

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
-0,000945726	0,317611693	- 0,04104796	0,016059	-0,00152%	-0,06508%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	- 0,001057	- 0,000023	0,00000%	0,02219%

Risk-free average	0,02449%
Mutual Fund Return	0,02297%
Benchmark ETF Return	0,02219%

Global

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
-0,008038473	0,410346178	0,06915809	- 0,019910	0,01505%	0,11586%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	- 0,089606	- 0,001184	0,00000%	-0,09389%

Risk-free average	0,02449%
Mutual Fund Return	0,04050%
Benchmark ETF Return	-0,09389%

Horizonte

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
0,01275868	7,37468E-07	- 0,09317090	- 0,010636	-0,01412%	-0,15855%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	0,022266	0,000429	0,00000%	0,06371%

Risk-free average	0,02084%
Mutual Fund Return	0,00727%
Benchmark ETF Return	0,06371%

Liquidity

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
-0,00024637	0,814386439	- 0,40741475	0,654087	-0,01610%	-0,76357%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	0,022266	0,000429	0,00000%	0,06371%

Risk-free average	0,02084%
Mutual Fund Return	0,00472%
Benchmark ETF Return	0,06371%

Plus

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
0,006434319	3,20425E-05	- 0,13937903	- 0,018904	-0,01244%	-0,24752%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	0,022266	0,000429	0,00000%	0,06371%

Risk-free average	0,02084%
Mutual Fund Return	0,00867%
Benchmark ETF Return	0,06371%

Premium

Fund Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
-0,0260951	0,142113045	- 0,06306634	0,013520	-0,03642%	-0,04721%
ETF Beta	Beta's p-value	Sharpe Ratio	Treynor Ratio	Jensen's alpha	M-Squared
1	0	- 0,040398	- 0,000436	0,00000%	-0,02275%

Risk-free average	0,02084%
Mutual Fund Return	-0,01444%
Benchmark ETF Return	-0,02275%

In the case of BBVA, it can be observed that just two of the mutual funds and three of the benchmarks exhibited negative returns for the period under study. Five of the portfolios failed to reject the null hypothesis that their respective beta has some relation with the benchmark. These five portfolios also have negatives betas. The rest of the portfolios have positive betas and rejected the null hypothesis at the chosen confidence level of 95%. As mentioned before,

the Treynor ratio is useless in the case of the portfolios that exhibit negative betas. Also it is important to mention that five of the portfolios managed by BBVA¹⁷ outperformed their benchmark in terms of absolute returns. However, there is evidence that just two of the nine actively managed portfolios by BBVA were able to beat their respective benchmarks on a risk-adjusted basis for the period under study. The balanced and global portfolios outperformed the benchmark in all performance measures, with the exception of the Treynor ratio in the global portfolio, which is in this particular case is inconclusive due to the presence of a negative Beta that failed to reject the null hypothesis of no relationship between the variables.

CONCLUSIONS

After considering the results obtained in the study, there is evidence that by using common performance measures just two of the thirty (30) Colombian mutual funds under study were able to beat a market benchmark on a risk-adjusted basis. These results are consistent with the empirical evidence found in the literature than in general and with a few exceptions active managers are able to outperform a market benchmark on a risk-adjusted basis. Therefore, a Colombian investor will be better off by investing in a passively managed ETF than in an actively managed Colombian private pension open mutual fund with similar investment objectives. However, there is evidence than in 10 of the 30 cases under study, the Betas of the mutual funds were statistically insignificant. This means that common performance measures such as the Jensen's alpha and the Treynor ratio do not have enough statistical strength to be considered as meaningful performance measures in these specific cases. However, in all the remainder cases the performances measures are statically sound on a daily return basis. Finally, it is important to mention that since the ETFS and the Colombian private open mutual funds industries are relatively new, there is not enough data to conduct a study on a monthly basis which is the usual practice for this kind of research. The results obtained can set the ground for further research in the relevance and the role of active portfolio managers in Colombia as well as other topics regarding market efficiency in Colombia.

¹⁷ The portfolios that beat their respective benchmarks in terms of absolute returns are: Balanced, Money, Enterprises, Global and Premium.

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